

REMARKS

Claims 1-3 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. Regarding claims 1 and 2, the Office Action states at page 2, paragraph 5, that merely measuring a gain would not appear to be sufficient to constitute a tangible result, since the outcome of the measuring step has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. Claims 1 and 2 are amended to recite measuring a gain of the analog filter in the DUT and a frequency characteristic by using an output of the analog filter for testing the DUT. Therefore, the measuring step is used to test the DUT, which is a tangible result. Regarding claim 3, the Office Action states at page 2, paragraph 6, that merely measuring a boosting gain would not appear to be sufficient to constitute a tangible result. Claim 3 is amended to recite performing a differential and a fast Fourier transform (FFT) operation on the output response of the equalization filter so as to measure a boosting gain and a frequency response for testing the equalizing filter. Therefore, the measuring step is used to test the equalizing filter, which is a tangible result. It is believed that claims 1-3 are amended in such a manner that the rejections of claims 1-3 are overcome. Accordingly, reconsideration of the rejections of claims 1-3 under 35 U.S.C. 101 is respectfully requested.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being obvious over Fera (U.S. Patent Number 6,405,147). Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fera in view of Becker, *et al.* (U.S. Patent Number 5,929,628). In view of the following remarks, the rejections are respectfully traversed, and reconsideration of the rejections is requested.

In the present invention as claimed in claims 1 and 2, a filter characteristic measuring method includes generating an impulse signal, applying the impulse signal to a DUT having an analog filter through a digital channel, and measuring a gain of the analog filter in the DUT and a frequency characteristic by using an output of the analog filter for testing the DUT.

In the present invention as claimed in claim 3, an analog filter characteristic method includes applying an impulse signal to an equalizing filter by using a digital

channel of an automatic tester, and then obtaining an output response of the equalizing filter.

In the present invention as claimed in claims 4-6, a system for measuring a characteristic of a filter in a DUT employing an analog filter includes a digital channel that provides an impulse signal without applying a sine wave to the analog filter of the DUT.

Fera discloses a system 200 for measuring signal transfer characteristics of a device under test (DUT) 22. The system 200 includes a stimulus waveform generator 20 that produces an analog stimulus waveform or signal 21 that is applied to an input port of the DUT 22. The stimulus waveform 21 is a time sequence of amplitude modulated, analog signals. An analog-to-digital converter (ADC) 24 samples and digitizes an output signal 23 from the DUT 22 to produce a sampled sequence 25. A signal processor 26 stores and samples the sampled data sequence 25 and produces output data and measurement results. The system 200 is capable of measuring the complex magnitude and phase of images relative to a point near mid-band. This information can be used to compute coefficients of a finite impulse response (FIR) filter for equalization. By applying measurement methods of a system 200, computed finite impulse response (FIR) coefficients used for an equalizer as well as plotted data, both before equalization and after equalization, can be obtained.

With regard to the rejections of claim 1 and 2, the Office Action states at page 3, paragraph 4, that although Fera is silent on the teaching of the steps of generating an impulse signal and applying the impulse signal to the DUT, it would have been obvious to one of ordinary skill at the time the invention was made to teach of the steps of generating an impulse signal and applying the impulse signal to the DUT for the purpose of obtaining a method of measuring characteristic of an analog filter since a finite impulse response (FIR) filter for equalization can be used for producing a measured result. The applicant respectfully disagrees. In Fera, the FIR filter for equalization is not used for producing a measured result, but rather, based on the measured results of the system 200, the FIR coefficients are obtained and used by an equalizer. Generating an impulse signal and applying the impulse signal to the DUT would not have been obvious from the teaching in Fera of measured results of the system 200 being used to determine FIR coefficients.

With regard to the rejection of claim 3, the Office Action states at page 4, paragraph 3, that although Fera is silent on the teaching of the steps of applying the impulse signal to the equalizing filter, it would have been obvious to one of ordinary skill at the time the invention was made to teach of the steps of applying the impulse signal to the equalizing filter for the purpose of obtaining a method of measuring characteristic of an analog filter since a finite impulse response (FIR) filter for equalization can be used for producing a measured result. The applicant respectfully disagrees. In Fera, the FIR filter for equalization is not used for producing a measured result, but rather, based on the measured results of the system 200, the FIR coefficients are obtained and used by an equalizer. Generating an impulse signal and applying the impulse signal to the DUT would not have been obvious from the teaching in Fera of measured results of the system 200 being used to determine FIR coefficients.

With regard to the rejection of claims 4-6, the Office Action states at page 5, paragraph 2, that although Fera is silent on the teaching of a digital channel for providing an impulse signal without applying a sine wave to the analog filter of the DUT, it would have been obvious to one of ordinary skill at the time the invention was made to teach a digital channel for providing an impulse signal without applying a sine wave to the analog filter of the DUT for the purpose of obtaining a method of measuring characteristic of an analog filter since a finite impulse response (FIR) filter for equalization can be used for producing a measured result. The applicant respectfully disagrees. In Fera, the FIR filter for equalization is not used for producing a measured result, but rather, based on the measured results of the system 200, the FIR coefficients are obtained and used by an equalizer. Generating an impulse signal and applying the impulse signal to the DUT would not have been obvious from the teaching in Fera of measured results of the system 200 being used to determine FIR coefficients.

In the present invention, applying an impulse signal to a DUT has the same meaning as simultaneously applying sine waves of all frequencies to the DUT. In Fera, the stimulus waveform 21, which is a time sequence of amplitude modulated, analog signals, is applied to a DUT 22. The stimulus waveform 21 is not an impulse signal as claimed.

Therefore, Fera fails to teach or suggest a filter characteristic measuring method that includes generating an impulse signal and applying the impulse signal to a DUT

having an analog filter through a digital channel, as claimed in claims 1 and 2. The Fera stimulus waveform 21 is not an impulse signal as claimed. Fera further fails to teach or suggest an analog filter characteristic measuring device that includes applying an impulse signal to an equalizing filter by using a digital channel of an automatic tester, as claimed in claim 3. The Fera stimulus waveform 21 is not an impulse signal as claimed.

Fera fails to teach or suggest elements of the invention set forth in claims 1-3. Specifically, Fera fails to teach or suggest a filter characteristic measuring method that includes generating an impulse signal and applying an impulse signal to a DUT having an analog filter through a digital channel, as claimed in claims 1 and 2, and an analog filter characteristic measuring method that includes applying an impulse signal to an equalizing filter by using a digital channel of an automatic tester, as claimed in claim 3. Therefore, it is believed that the claims are allowable over the cited reference, and reconsideration of the rejections of claims 1-3 under 35 U.S.C. 103(a) as being obvious over Fera, is respectfully requested.

Fera further fails to teach or suggest a system for measuring a characteristic of a filter in a DUT employing an analog filter that includes a digital channel for providing an impulse signal without applying a sine wave to an analog filter of a DUT, as claimed in claims 4-6. The Fera stimulus waveform 21 is not an impulse signal as claimed.

Becker, *et al.* is cited in the Office Action as disclosing a controller 206 for controlling the digital channel 212 and the digitizer 220. Becker, *et al.* fails to teach or suggest a characteristic of a filter in a DUT employing an analog filter that includes a digital channel for providing an impulse signal without applying a sine wave to an analog filter of a DUT, as claimed in claims 4-6.

Fera and Becker, *et al.* fail to teach or suggest elements of the invention set forth in claims 4-6. Specifically, Fera and Becker, *et al.* fail to teach or suggest a characteristic of a filter in a DUT employing an analog filter that includes a digital channel for providing an impulse signal without applying a sine wave to an analog filter of a DUT, as claimed in claims 4-6. Accordingly, there is no combination of the references which would provide such teaching or suggestion. Neither of the references, taken alone or in combination, teaches or suggests the invention set forth in claims 4-6. Therefore, it is believed that claims 4-6 are allowable over the cited references, and reconsideration of


Application Number: 10/737,149
Amendment Dated January 12, 2007
Reply to Office Action of: October 13, 2006

the rejections of claims 4-6 under 35 U.S.C. § 103(a) based on Fera and Becker, *et al.*, is respectfully requested.

In view of the amendments to the claims and the foregoing remarks, it is believed that, upon entry of this Amendment, all claims pending in the application will be in condition for allowance. Therefore, it is requested that this Amendment be entered and that the case be allowed and passed to issue. If a telephone conference will expedite prosecution of the application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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